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CONTRACTOR REPORT ARRAD-CR-86001

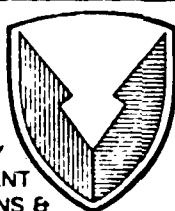
HAZARDS CLASSIFICATION OF MTSQ FUZE M582A1  
IN AMMUNITION BOX

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ARDEC

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SAFETY OFFICE

DOVER, NEW JERSEY

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27 10 1987

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The MTSQ fuze M582A1 in a non-propagating shipping container was tested in accordance with the DoD Explosive Hazard Classification Procedures. In the single package test, there was no detonation of total contents. There was no propagation between fuzes in the container. In the external fire stack test, there was no mass explosion. Based on interpretation of results, a probable Division (1.4) (DOT Class C) classification was indicated for the fuze in a non-propagating shipping container.		

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## INTRODUCTION

A series of tests were conducted for the U.S. Army Armament, Munitions and Chemical Command, Safety Office, Dover, NJ 07801, to provide data for the hazards classification of Fuze, MTSQ, M582A1, packaged in ammunition box. The testing involved the conduct of three single package tests and a single external fire stack test, which were conducted in accordance with Army TB 700-2 "Department Of Defense Explosives Hazard Classification Procedures", September 1982. The procedures, details and results of this test series are described in this report.

## DISCUSSION

### TEST HARDWARE

The test hardware consisted of a total of 64 Fuze MTSQ M582A1 packaged eight (8) to a M2A1 Ammo Box. See Figures 1 to 10 for fuze explosive train drawings and Figure 11 for the Ammo Data Card. Details of the Ammo Box and non-propagation packaging are shown in Figures 12 to 19.

The rear end of each fuze was supported by a heavy wall cardboard tube. This system provided an air space plus approximately 1/2 inch of cardboard material between adjacent boosters.

The booster had a metal casing and was loaded with 23.2 grams Comp A-5 (97% RDX).

### SINGLE PACKAGE TESTS

Three ammunition boxes each containing eight fuzes and internal packaging were used in the conduct of three single package tests (1 box with 8 fuzes per test).

Initiation of one of the interior fuzes was accomplished in two ways. In test 221 the booster was removed from the fuze. The fuze was replaced with a wooden mockup which had the same external geometry as the fuze. The booster was initiated by means of a Reynolds Industries RP-87 exploding bridge wire (EBW) detonator, which has an output charge consisting of 47 MG RDX plus a MK9 lead containing 363 MG of CH-6. In tests 222 and 224 the booster was unscrewed from the fuze and the RP-87/MK 9 were placed on their side sandwiched between the fuze and booster. The initiation geometries are depicted in Figure 20.

Each test was conducted with confinement provided on all sides of the ammunition box. The confinement was provided by burying the boxes in soil such that the top was flush with the ground. A hole was dug in the ground and a piece of plywood 5/8 X 12 X 12 inches placed in the bottom of the hole. The box was placed directly on top of the plywood and soil was compacted around the box sides and ends. Top confinement varied. In test 221 a 0.25 X 24 X 36 inch armor plate was placed on top of the ammo box and was covered with a single sand bag. In test 222 the armor plate plus three sandbags were used. In test 224 seven sandbags (no steel plate) were used.

A closed circuit TV system was used to observe each test. After booster initiation the test area was kept clear for 1/2 hour. Following the 1/2 hour waiting period the site was visually inspected and the results documented by note taking and photographs.

In test 221 the armor plate and sandbag were thrown clear of the ammo box and the box itself and fuzes were ejected from the pit. Several of the cardboard packing tubes were observed to smolder for approximately 20 minutes following detonation of the booster. Only the initiated booster fired high order as determined by the large circular hole made in the box bottom. All seven remaining fuzes remained integral. Three of the attached boosters were substantially deformed (crushed in approximately 1/4 inch) on the side facing the initiated booster.

In test 222 the ammo box and several of the fuzes remained in the pit, apparently due to the increased confinement. Only the initiated booster fired high order as determined by the large circular hole made in the box bottom. The other seven fuzes did not initiate. Boosters were crushed and separated from three of these fuzes. Two of the booster cups retained the Comp A-5 explosive while the third was emptied.

In test 224 the ammo box and several of the fuzes remained in the pit, apparently due to the increased confinement. Only the initiated booster fired high order as determined by the large circular hole made in the box bottom. The other seven fuzes did not initiate. The boosters were crushed and separated from three of these fuzes (similar to test 222).

Selected photographs of the test assembly and post test views are contained in Figures 21 to 27

#### EXTERNAL FIRE STACK TEST

Five ammunition boxes each containing eight fuzes and internal packaging were used in the conduct of the external fire stack test. The five boxes were banded together using steel strapping. The five box assembly was in turn banded to a steel burn test fixture.

Three insulation board fragment recovery packs, each containing 48 - 1/2 X 48 X 96 inch panels were set up with the 8 ft. dimension vertical and the 4 ft. dimension perpendicular to a nominal fragment line of flight. (See Figure 28)

Combustible material consisting of one inch pine boards (broken up scrap wooden ammunition boxes) was placed so as to completely fill the space under the 50 inch square X 55 1/2 inch high steel burn fixture frame work. Additional boards were placed around and on top of the ammunition boxes. The wood was soaked with 15 gallons of No. 2 fuel oil. The fire was ignited remotely by means of two igniters consisting of an electric match, an ignition mix of black powder and BK NO<sub>3</sub>, and a booster mix of M30 propellant.

The test was observed and recorded using a CCTV system. A microphone was placed approximately 50 ft. from the test fixture and was utilized to monitor detonations or deflagrations which provided a substantial audible report. The microphone outputs were recorded on the video tape. The test was conducted in the afternoon and the area was kept clear of personnel until the following morning. Test results were evaluated from the video tape, by inspection of the test site (fuzes, fuze debris and ammunition box debris on the ground) and by recovery of metal fragments from one of the recovery packs. Documentary photographs were obtained. Two of the three fragment recovery packs burned and no fragments were recovered from these packs.

A study of the video tape, with superimposed audio, indicated a total of 16 discrete audible events (detonation or deflagration). After ignition the fire burned for seven minutes before any of the fuzes produced audible cookoff. In the next minute there were eleven discrete audible reports.

At seven minutes there was a loud audible report and explosion from the stack. This was shortly followed by three reports which were audible but of substantially less amplitude (one from the stack and two from the base of the fire). Over the remainder of the minute there were three lower amplitude reports (one from the stack and two from the base of the fire) and three more loud reports (one from the stack and two from the base of the fire). Near the eight minute point there was a very loud report and visually violent explosion which scattered a lot of material. Judging from the violence of this event there was a multiple reaction of boosters. Following this event there was no remaining material atop the burn fixture. There were four additional reports from the base of the fire over the next four minutes (two loud and two lower amplitude). Thirty four minutes after fire ignition another fuze was cooked off (lower amplitude) by a fire produced by burning of one of the insulation board recovery packs.

The day following the test the ground area out to a radius of approximately 300 ft. was searched for debris. Fuze debris and ammunition box pieces were found as far as 265 ft. from the burn fixture. Figure 29 is a map showing the location of some of the principal debris recovered.

Of the 40 fuzes tested, parts of 33 were recovered. Five were recovered with booster attached. The plastic windows over the time delay indicator were melted. An additional 12 were recovered intact less booster (also with melted window). Sixteen fuze internal components were recovered. These had been damaged similar to the ones which fired high order in single stack tests 221, 222 and 224. Also seven booster cups were found with no Comp A-5 load.

A total of eight fragments were recovered from the westerly insulation board recovery pack. The front panel captured five fragments which are apparently all from fuze debris (two aluminum and three steel). The second panel captured three fragments which are also apparently from fuze debris and are all steel. Individual fragment weights are listed in Table I. The recovery pack face represents a solid area of .1107 steradians.

Examination of the steel burn fixture indicates that at least three high order reactions (explosions) occurred within the stack, two of which appeared to be single booster detonations. These explosions both produced substantial localized single dents in the two inch pipe supports. The third explosion produced bowing of two adjacent pipes but no distinct localized dents. This could have been caused by detonation or deflagration of one or more boosters within the center of an ammo box.

Selected photographs of the test setup and post test views are contained in Figures 30 to 37.

## RESULTS

### SINGLE PACKAGE TESTS

In the three single package tests high order detonation of the initiated booster was achieved but none of the other fuzes in the box reacted either high or low order. In each test all seven fuzes and boosters were recovered. The boosters nearest to the initiated booster were severely crushed and in some cases separated from the fuze body.

### EXTERNAL FIRE STACK TEST

Five metal ammo boxes each containing eight M582A1 fuzes were strapped together and exposed to a hot wood/fuel oil fire. A total of 16 discrete explosions were observed. Of these, five emanated from the stack. The remainder came from the base of the fire, apparently resulting from fuzes falling into the fire when the ammunition boxes ruptured.

Two of the explosions within the stack were apparently high order detonations of single boosters, as the noise level was similar to that observed from a single package test. This was also indicated by the effect on the steel burn fixture. Each of these detonations would have caused rupture of an ammo box and dispersion of at least a box full of fuzes.

One of the explosions was substantially more violent both audibly and visually. This was apparently a multiple detonation within a box. Examination of the burn fixture indicated that three substantial explosions occurred (two apparently from single booster detonations). In the third explosion the number of boosters which detonated cannot be determined (could be one or more).

The NATO ammunition data card is contained on the following page.



AC/258

# **NATO DATA CARD AMMUNITION CLASSIFICATION TEST RESULTS**

1. SECURITY CLASSIFICATION:

UNCLASSIFIED

3. TESTING NATION:

4. ADDRESS OF NATIONAL TESTING AUTHORITY:

2. NATO TEST REFERENCE:

DIRECTOR  
USA AMC FIELD SAFETY ACTIVITY  
ATTN: AMXOS-SE  
CHARLESTOWN, IN 47111-9669

4. TESTING SERVICES AND REFERENCE:

5. NATO STOCK NUMBER:

1390-01-158-8193

7. CALIBRE OR WEIGHT:

20.775Kg (45.8 lbs)

6. ITEM NAME AND MODEL DESIGNATION:

Fuze MTSQ M582A1

2. TYPE OF PACKAGE AND PACKING MATERIALS:

M2A1 Ammunition Box with Tubes for Non Propagating Packaging

9. GROSS WEIGHT OF ITEM (ROUND, BOMB, ETC) KG	11. NUMBER OF ITEMS IN EACH PACK	12. GROSS WEIGHT OF PACK KG	13. TYPES OF EXPLOSIVE	EXPLOSIVES PER ITEM (KG)	15. NET QUANTITY FOR COMPUTATION OF QD
20.775 Kg	8 per metal box	9.89 Kg	(a) BURSTING CHARGES		
	16 per wire-bound box		(b) PROPELLANT		
(45.8 lbs)		(21.8 lbs)	(c) OTHER EXPLOSIVES	.0239 Kg	.0239 Kg.
6. HAZARD DIVISION:		18. UN SERIAL NO:	19. AUTHORITY AND DATE:		
1.4		0410	a. TB 700-2		
7. COMPATIBILITY GROUP:			b. LETTER, DRCSF, SUBJECT: COORDINATION AND APPROVAL OF HAZARD CLASSIFICATION, 6 AUG 81		
D			c.		

## 20. SINGLE PACKAGE DETONATION TEST RESULTS

FIRST TEST : No Detonation of total contents  
No propagation between Fuzes in the container.

SECOND TEST: No Detonation of total contents.  
No propagation between Fuzes in the container.

THIRD TEST : No Detonation of total contents.  
No propagation between Fuzes in the container.

## 21. STACK DETONATION TEST RESULTS

NUMBER OF PACKAGES IN TEST:

FIRST TEST : Tests not performed

SECOND TEST:

THIRD TEST :

## 22. STACK FIRE TEST RESULTS

NUMBER OF PACKAGES IN TEST:

First reaction occurred 7 minutes after initiation of fire stack. Sporadic eruptions with an audible report continued for approximately 34 minutes. There was no mass detonation of total contents. Maximum debris distance (no hazardous fragments) was 265 feet.

## 23. REMARKS:

TABLE I

FRAGMENTS RECOVERED FROM WESTERLY PACK

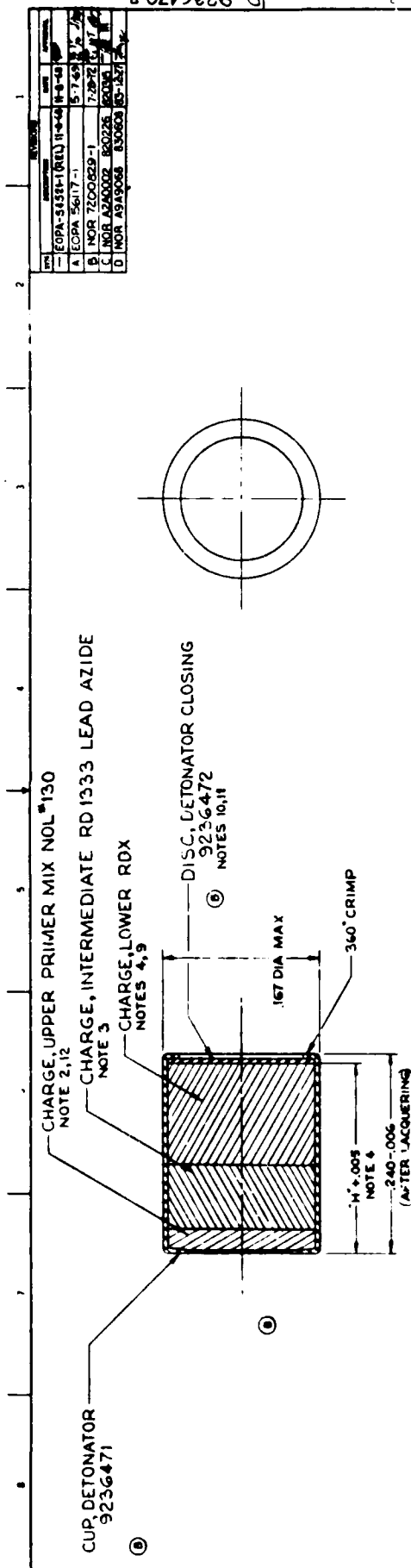
FRAGMENT WEIGHT (GRAMS)

LAYER 1

.26  
.10  
.09  
.03  
.02

LAYER 2

1.26  
.20  
.17



- NOTES:-
- 1- SPEC MIL-A-2350 AND MIL-D-40111 APPLY.
  - 2- UPPER CHARGE:- 23.3 MILLIGRAMS PRIMER MIX NOL 130 (NOTE 5) PRESS AT APPROXIMATELY 70,000 PSI.
  - 3- INTERMEDIATE CHARGE:- 75 ± 5 MILLIGRAMS RD 1333 LEAD AZIDE (SPEC MIL-L-46223) PRESS AT 30,000 ± 3,000 PSI (NOTE 14)
  - 4- LOWER CHARGE:- APPROXIMATELY 70 MILLIGRAMS RDX PELLET (TYPE 1, SPEC MIL-P-45486) PREPULLETED TO A DENSITY OF 1.60 ± 0.3 GRAMS/CC WITH A .151 OD MAX AND RECONSOLIDATED AT 20,000 PSI MIN AND 30,000 PSI MAX ESTABLISH "H" TO PROVIDE TIGHT CRIMPING OF CLOSING DISC. A VALUE OF 223 HAS BEEN USED SATISFACTORILY FOR "H" (NOTE 9) DIMENSION APPLIES BEFORE CRIMPING.
  - 5- PRIMER MIX NOL 130:-

COMPOSITION

PERCENTAGE BY WEIGHT

BASIC LEAD STYPHINATE, TYPE 1, SPEC MIL-L-16355 (NOTE 6)	40% ± 2%
ANTIMONY SULFIDE, CLASS 5, SPEC MIL-A-155	15% ± 1.5%
BARIUM NITRATE, CLASS 1, GRANULATION A, SPEC MIL-B-162 (NOTE 7)	20% ± 2%
LEAD AZIDE, TYPE 1, SPEC MIL-L-3055	20% ± 2%
TETRACENE, SPEC MIL-T-46936 (NOTE 8)	5% ± 0.5%

6- BASIC LEAD STYPHINATE SHALL PASS 90% MIN THROUGH A No. 325 U.S. STANDARD SIEVE, SPEC RR-S-366.

7- BARIUM NITRATE SHALL PASS 50% MIN THROUGH A No. 325 U.S. STANDARD SIEVE AND BE RETAINED 99% MIN ON A No. 140 U.S. STANDARD SIEVE, SPEC RR-S-366.

8- TETRACENE SHALL PASS 50% MIN THROUGH A No. 325 U.S. STANDARD SIEVE, SPEC RR-S-366.

9- INTERMEDIATE LOWER CHARGE APPROXIMATELY 10 MILLIGRAMS RDX, TYPE B, CLASS A (SPEC MIL-R-398) PRESS AT APPROXIMATELY 20,000 PSI AND ESTABLISH "H" TO PROVIDE TIGHT CRIMPING OF CLOSING DISC. A VALUE OF 223 HAS BEEN USED SATISFACTORILY FOR "H". DIMENSION APPLIES BEFORE CRIMPING.

10- CRIMPING SEAL JOINT AND CLOSING DISC MUST BE TIGHT. CRIMPING OF CLOSING DISC WITH GREEN, NO. 1410 LACQUER, CELLULOSE NITRATE, TYPE 1, SPEC MIL-L-40287.

11- DETONATOR CLOSING DISC MUST BE TIGHT. CRIMPING OF CLOSING DISC WITH GREEN, NO. 1410 LACQUER, CELLULOSE NITRATE, TYPE 1, SPEC MIL-L-40287.

12- ADVISORY: CARE SHOULD BE TAKEN TO INSURE THAT THE INGREDIENTS OF FRESH PRIMER MIX HAVE NOT SEGREGATED BEFORE PRIMER MIX IS LOADED INTO DETONATOR.

13- EXTERIOR OF ASSEMBLY MUST BE FREE OF EXPLOSIVES.

14- ALTERNATE MATERIAL LEAD AZIDE SPECIAL PURPOSE (SPEC MIL-L-46223).

U.S. ARMY LABORATORY RESEARCH AND DEVELOPMENT CENTER  
DEVTEC, WED. ARMY 5001

CURRENT DESIGN ACTIVITY FSCM NO. 19200

① ② ③

PART NO. 9236470

PROXIMITY ARSENAL, DORSET, NEW JERSEY

DETONATOR, STAB:

M 94

9236470

FIGURE 1

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	SYM	DESCRIPTION	DATE	APPROVAL
		-	PRODUCTION RELEASE ERR A9A9068 830608 (FCP A3A2070 831101)	83-12-27	<i>eye</i>

NATIONAL STOCK NO.	COMBINATION OF ADOPTED ITEMS	DWG OR PART NO.
1390-01-158-8193 N286	16- FUZE, MTSQ, M582E1 16- TUBE 2- SUPPORT, TOP  2- BOX, AMMUNITION, M2AI 1- BOX, WIREBOUND	9352383 9328329 9232149  7553296 8861213

NOTES:

1- INNER PACKAGING- 8 FUZES PER M2AI METAL BOX, PACKAGED IN ACCORDANCE WITH DWG. 8864492.

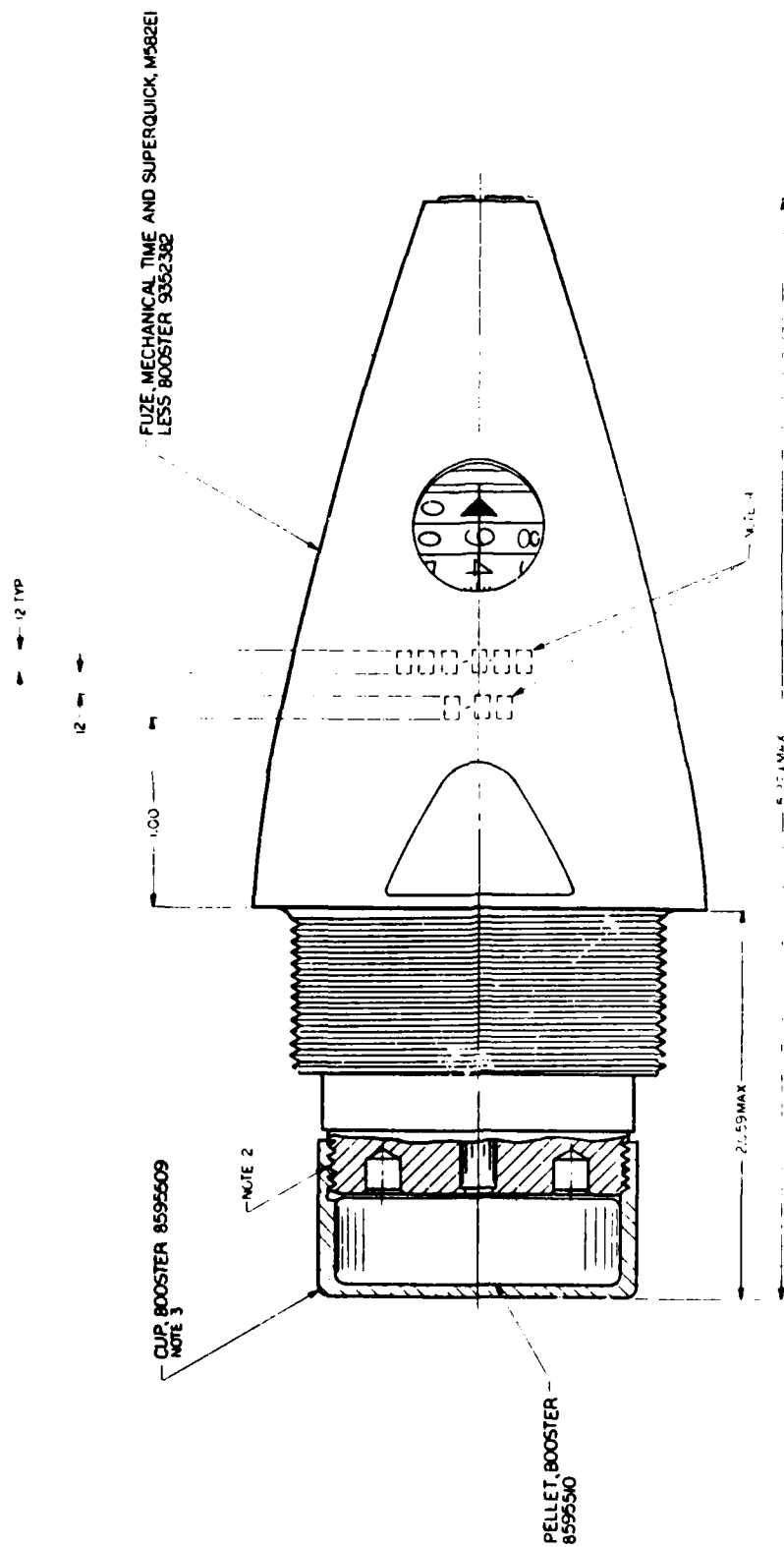
2- OUTER PACKAGING- 2 M2AI BOXES (16 FUZES) IN A WOOD WIREBOUND BOX, PACKAGED IN ACCORDANCE WITH DWG. 8861213.

**PART NO. 9362795**

ORIGINAL DATE OF DRAWING 83-12-27		U S ARMY ARMAMENT RESEARCH AND DEVELOPMENT CENTER D' JER, NEW JERSEY 07801	
DRAFTSMAN JS	CHECKER	COMBINATION OF ADOPTED ITEMS FOR: FUZE, MECHANICAL TIME AND SUPERQUICK, M582E1	
ENGR	ENGR		
ENGR	ENGR		
<i>Ernest J. Chesky</i>		SIZE A	FSCM NO. 19200
<i>Ernest J. Chesky</i>		9362795	
SCALE —		UNIT WT	SHEET

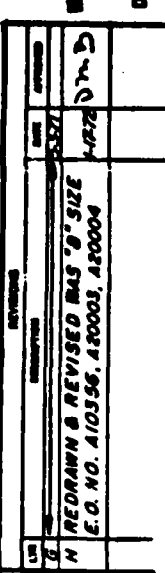
ARRADCOM FORM 65 JUN 78 REPLACES SARPA FORM 1038 OCT 75 WHICH IS OBSOLETE

1. SPEC. MIL-A-2250 AND MIL-F-8880C (5A) APPLY.  
2. APPLY MIL-A-4860G, DING 923600, IN ADHESIVE SEALANT, SILICONE RTV, GENERAL PURPOSE.  
3. APPLY MIL-A-4860G, TYPE 1, CUB WET, TO INDEXED THREADS, 360° AND ASSEMBLE BOOSTER  
CLIP BOOSTER AT HESIVE IS WET.  
4. BOOSTER CLIP TO WITHSTAND A DISASSEMBLY TORQUE OF 35 INCH POUNDS MINIMUM.  
5. MARK DR STAMP WITH GUNTER CAPITAL LETTERS, LOT NO AND DATE LAPPED.  
6. USING INK, STENCIL WHITE NO 2785 OR 3785 TYPE I OR II, SPEC TT-I, 1079.



**FIGURE 3**

[illegible]



1- INTERPRET DRAWING IN ACCORDANCE WITH MIL-A-2350 AND ALL DOCUMENTS CONTAINED THEREIN.

2- MATERIAL - PELLET ROX TYPE IIIA, SPEC. MIL-P-45486.

3- PELLETIZE AS SHOWN WITH 23.264  $\pm$  1.020 GM S.

4- ALTERNATIVE METHOD OF MANUFACTURE :- PERMIT .06 +.01 R ON ONLY ONE SIDE OF BOOSTER PELLET. ALTERNATIVE IS PERMISSIBLE ONLY WHERE ADEQUATE CONTROLS FOR PROPER ASSEMBLY ARE APPLIED.

5- A PELLET WHICH FAILS TO MEET THE WEIGHT REQUIREMENT PER NOTE 3 BUT MEETS THE DIMENSIONAL REQUIREMENTS SHALL BE ACCEPTABLE PROVIDED THE DENSITY OF THE PELLET IS BETWEEN 1.50 AND 1.70 GM/CC.

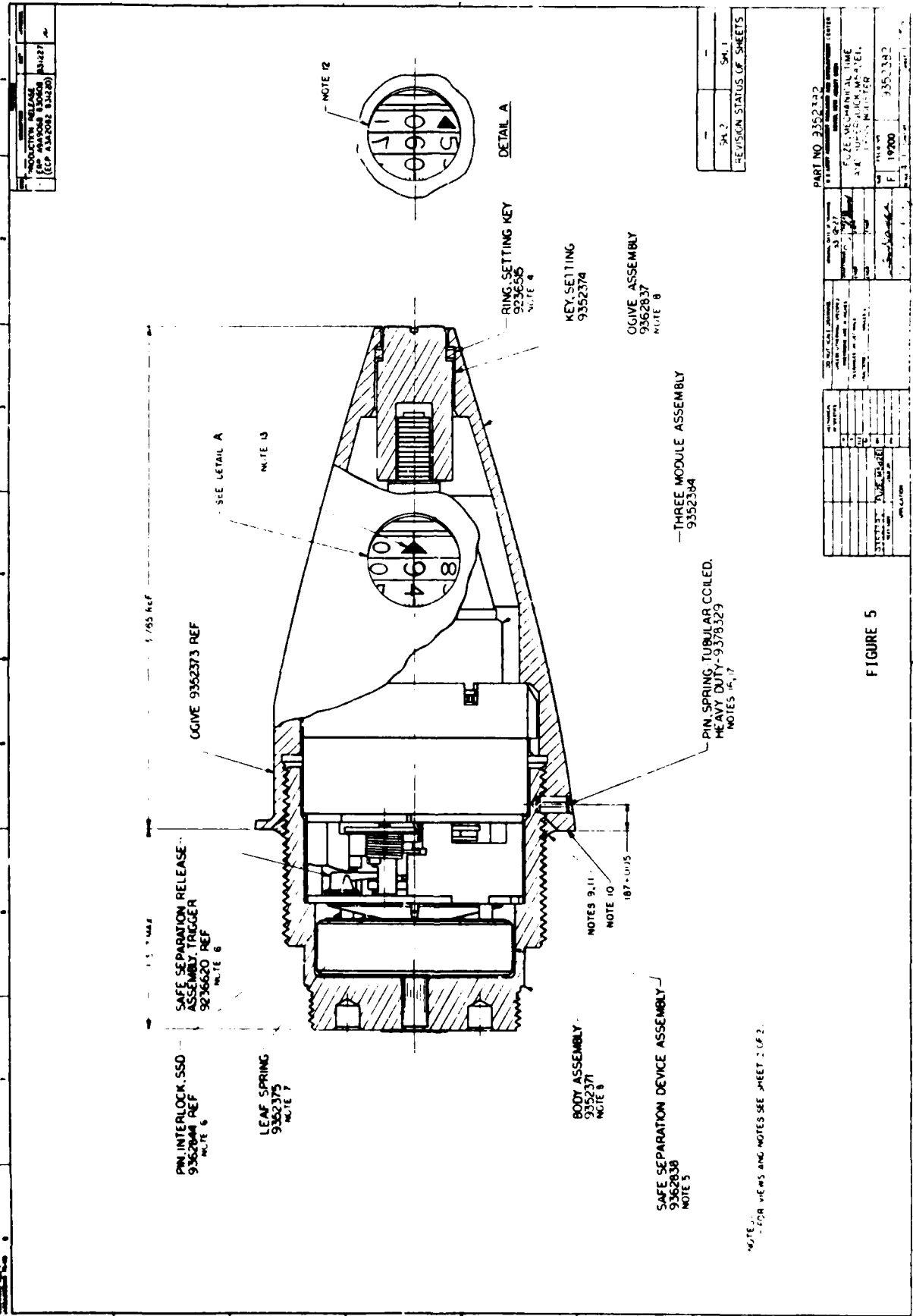
6- ADVISORY :- THE FACE OF PUNCHES USED TO CONSOLIDATE COMP A-5 SHOULD HAVE A FOUR(4) MICRO FINISH MIN. TO PREVENT STICKING.

7- ADVISORY :- IF THE COMP A-5, AS RECEIVED, HAS A SPREAD IN THE BULK DENSITY GREATER THAN 2.025 GM/ML, BLEND THE COMP A-5 TO OBTAIN A HOMOGENEOUS MIXTURE. A BLENDING TIME OF APPROXIMATELY 30 MINUTES HAS BEEN FOUND ACCEPTABLE WHEN USING A 500 POUND CAPACITY, BAFFLELESS, GEMCO BLENDER REVOLVING AT APPROXIMATELY 32 RPM.

**PART No. 8595510**

[illegible]

**FIGURE 4**

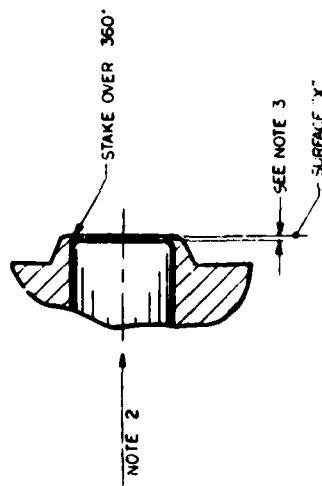






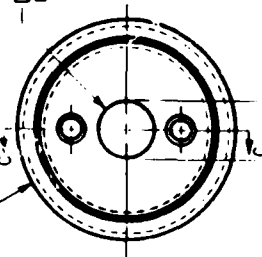
NOTES:

- 1 - SPEC MIL-A-2550 APPLIES.
- 2 - STAKE MUST WITHSTAND AN AXIAL PUSH-OUT FORCE OF 5 LBS MIN IN DIRECTION SHOWN PRIOR TO ASSEMBLY OF CLOSURE DISC.
- 3 - AFTER STAKING, STAKE AND LEAD MUST BE FLUSH OR BELOW SURFACE "X".
- 4 - CLOSURE DISC SHALL BE UNIFORMLY APPLIED AND SHALL EXHIBIT NO EVIDENCE OF BUBBLES OR CREASES.



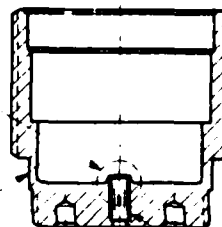
DETAIL B  
SCALE 10/1

2.000-12UNS-1A  
MAJOR DIA (E)



DISC. CLOSURE-9236493  
NOTES 2 & 4

BODY-9352372  
SEE DETAIL B



LEAD EXPLOSIVE, PASIO-9236504

SECTION C-C

50.06 REF  
50.04 DIA

FIGURE 7

SEE SEPARATE PARTS LIST - 9352371

PART NO 9352371		1:1 PART CATALOG NUMBER AND DEVELOPMENT CENTER	
DATE	REV	DATE	REV
13-12-27	1	13-12-27	1
BODY ASSEMBLY		BODY ASSEMBLY	
D 19200		9352371	
D 19200		9352371	





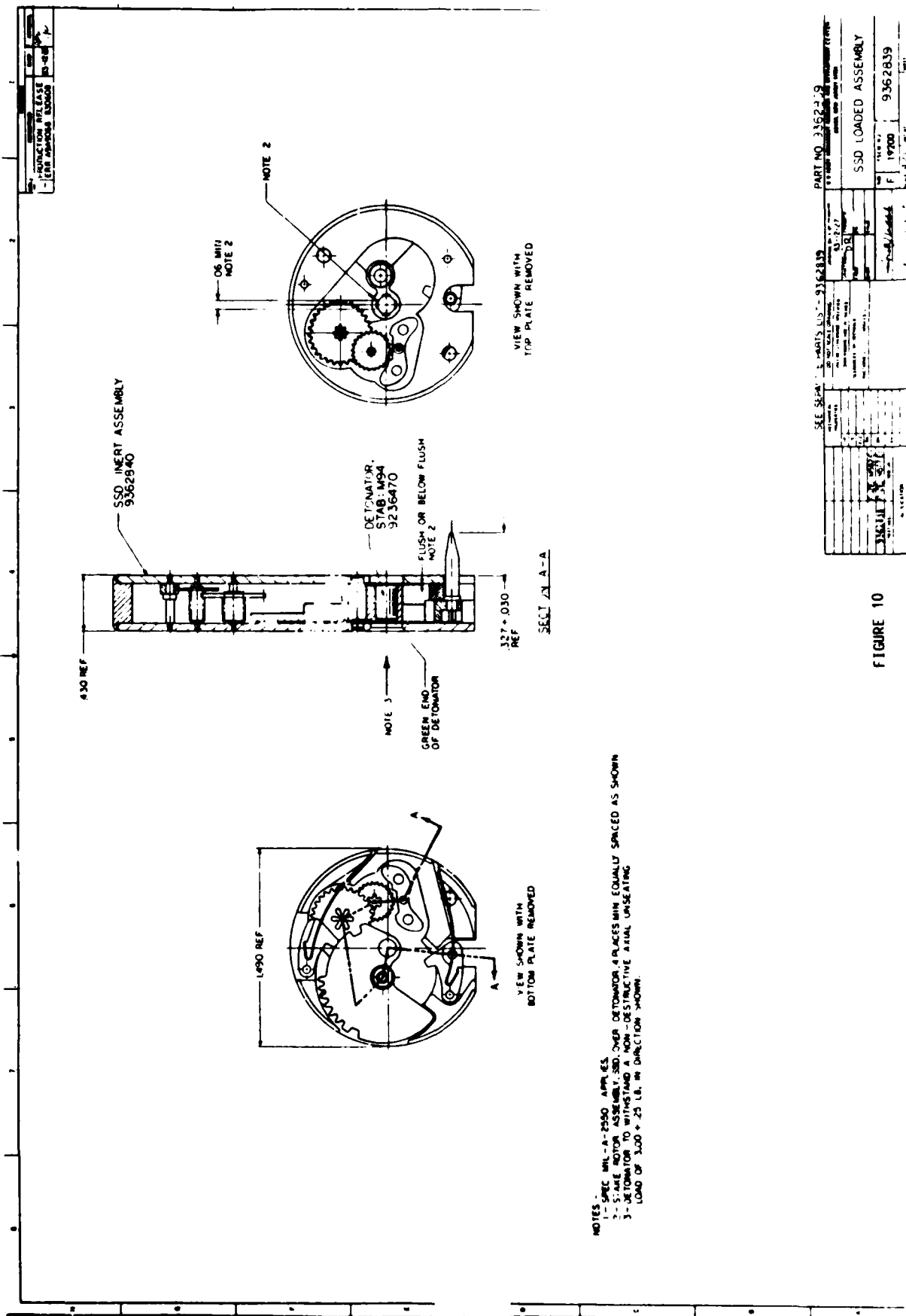


FIGURE 10

FIGURE 11

AMMUNITION DATA CARD

M582A1 FUZES IN METAL AMMO BOXES WITH NON-PROPAGATING PACK

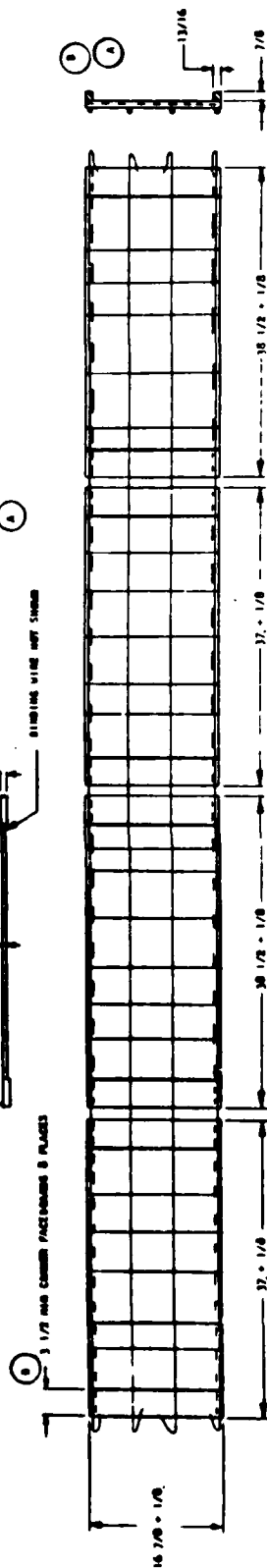
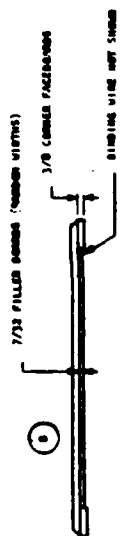
DEPARTMENT OF DEFENSE AMMUNITION DATA CARD		FORM APPROVED BUDGET BUREAU NO. 22-40388		LOT NUMBER MA-85E005-001	
ITEM NOMENCLATURE Fuze, MTSQ, M582A1		NSN 1390 01 158 8193-N286		PACKING OF LOT 8 Fuzes/Metal Ammo. Box, M2A1; 2 Metal Ammo. Boxes/Wirebound Box, Dwg. 8861213/AX; 36 Boxes/Pallet (Non Propagating Pack)	
MANUFACTURING, LOADING OR ASSEMBLING ACTIVITY MILAN ARMY AMMUNITION PLANT		NET QUANTITY 10,368			
CONTRACTOR MARTIN MARIETTA ORDNANCE SYSTEMS, INC.	CONTRACT OR ORDER NO. PRON No. F1498279	DRAWING OR REVISION 9352383 (See Note 2)		SPECIFICATION & REVISION See Note 1	
DATE STARTED 5-6-85	DATE COMPLETED 5-7-85	DATE INSPECTED 5-7-85	LINE H	ZONE WT SHELL	
CHARGE WEIGHT	EXPECTED MUZZLE VELOCITY	EXPECTED PRESSURE	SHELL WEIGHT		
EXPLOSIVE WT PER PKG	INDEX OF POWDER	MPD IN INCHES	PPDR IN INCHES		
NUMBER OF TEST SAMPLES 30	SENT TO Jefferson PG	DATE AND MODE OF SHIPMENT 5-10-85 C/C BTR No. 167-84			
COMPONENTS (CONTINUE ON REVERSE, IF NECESSARY).					
COMPONENT	DRAWING NO.	MODEL	MANUFACTURER	DATE MFG	LOT NO
Fuze, MTSQ Less Booster	9352382	M582A1	Hamilton Tech. Inc	HAT85B016-009	10,398
DISPOSITION  ACCEPTED			TYPED NAME OF GOVERNMENT INSPECTOR Jerry Laster		
DD FORM 1080 1 FEBRUARY 1988			SIGNATURE John E. Barber 6/14/85		



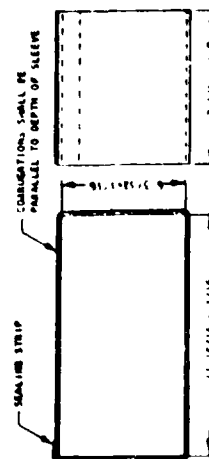
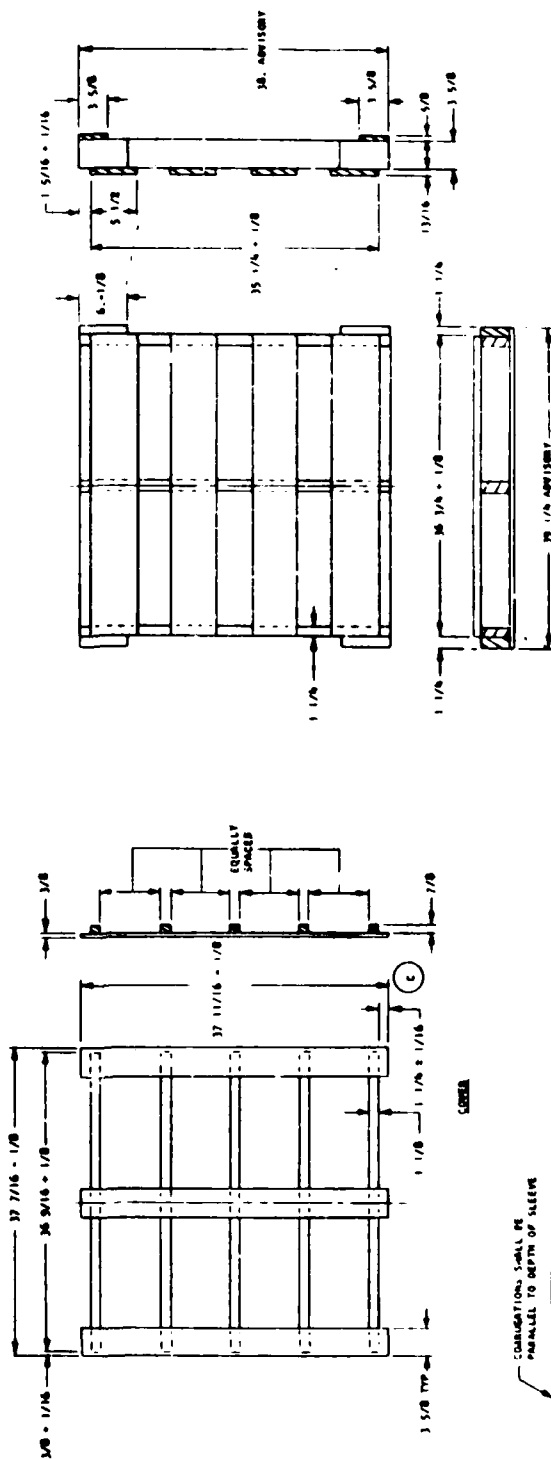






[illegible]

### FABRICATION OF SIDES AND ENDS



**FIGURE 15**

[illegible]

FIGURE 16

PACKAGING COMPONENTS			
NAME OF PART	MATERIAL	DRAWING OR SPEC NUMBER	REMARKS
1. ASSEMBLY	SEE TABLE, SHEET 2	18864492	
2. FILLER, BOTTOM	1. FILLER, SEE P. 18864492	18864492	
3. BOX, TOP	1. UNIT	18864492	
4. BAG, DESICCANT	1. BAG, DESICCANT	18864492	
5. BOTTOM SUPPORT	1. SEE TABLE, SHEET 2	18864492	
6. TOP SUPPORT	1. SEE TABLE, SHEET 2	18864492	
7. TAG FOR INTERPLANT SHIPMENT	1. MANILA PAPER	18864492	
8. TAG FOR INTERPLANT SHIPMENT	1. SEE TABLE, SHEET 2	18864492	
9. TAG FOR INTERPLANT SHIPMENT	1. SEE TABLE, SHEET 2	18864492	
10. TAG FOR INTERPLANT SHIPMENT	1. SEE TABLE, SHEET 2	18864492	
11. TAG FOR INTERPLANT SHIPMENT	1. SEE TABLE, SHEET 2	18864492	
12. TAG FOR INTERPLANT SHIPMENT	1. SEE TABLE, SHEET 2	18864492	

TOP SUPPORT (SEE TABLE)

BOX, AMMO, M201, DWG 1553296 (SEE NOTE 1)

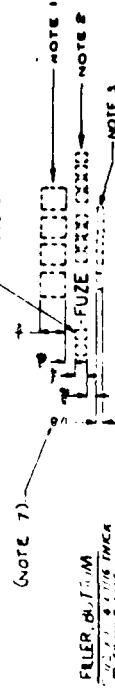
TAG FOR INTERPLANT SHIPMENT

12. MAX

BOTTOM SUPPORT (SEE TABLE)

ASSEMBLY (SEE TABLE)

P- FOR NON-PROPAGATING BACK AND INSTRUCTIONS, SEE SHEET 4.  
R- REQUIRED ONLY FOR NON-PROPAGATING BACK.  
S- SEE SHEET 4. TAG SHOWN FOR FILLER MARKING, NON-PROPAGATING, ON OUTER BOX.



MARKING INSTRUCTIONS FOR LOADER

THE LOADER SHALL APPLY MARKING WITH WHITE STENCIL INK. MARKING SHALL BE APPLIED ON ONE SIDE OF BOX AND SHALL BE READ FROM TOP TO BOTTOM.

- NOTES:
- 1- INSERT DEPARTMENT OF DEFENSE IDENTIFICATION CODE
  - 2- INSERT DEPARTMENT OF DEFENSE IDENTIFICATION CODE
  - 3- INSERT DEPARTMENT OF DEFENSE IDENTIFICATION CODE
  - 4- MARKING SHALL BE APPLIED ON ONE SIDE OF BOX AND SHALL BE READ FROM TOP TO BOTTOM.

MARKING SHALL BE APPLIED ON ONE SIDE OF BOX AND SHALL BE READ FROM TOP TO BOTTOM. MARKING SHALL BE APPLIED ON ONE SIDE OF BOX AND SHALL BE READ FROM TOP TO BOTTOM. MARKING SHALL BE APPLIED ON ONE SIDE OF BOX AND SHALL BE READ FROM TOP TO BOTTOM.

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MARKING SHALL BE APPLIED ON ONE SIDE OF BOX AND SHALL BE READ FROM TOP TO BOTTOM.

1. TOP SUPPORT	1. TOP SUPPORT	1. TOP SUPPORT
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3. TAG FOR INTERPLANT SHIPMENT	3. TAG FOR INTERPLANT SHIPMENT	3. TAG FOR INTERPLANT SHIPMENT
4. TAG FOR INTERPLANT SHIPMENT	4. TAG FOR INTERPLANT SHIPMENT	4. TAG FOR INTERPLANT SHIPMENT
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12. TAG FOR INTERPLANT SHIPMENT	12. TAG FOR INTERPLANT SHIPMENT	12. TAG FOR INTERPLANT SHIPMENT

DESICCANT BAG  
PLACE INSIDE CONTAINER

DESICCANT CONTAINER  
FORCE 1/8" DIA. RAILER HOLE  
IN TOP SUPPORT TO DEPTH OF  
APPROX 1/8" DIA. CONTAINER WILL  
BE POSITIONED PROPERLY WHEN  
DESICCANT IS PLACED ON  
OF FUSES

NOTE 8  
DECAL-9254754

PROX

PACKING INSTRUCTIONS (SEE NOTE 1)

ALL MATERIAL SHALL BE THOROUGHLY DRY AT TIME OF PACKING. MATERIAL SHALL BE PACKED TO PREVENT DAMAGE TO FUSES. INSERT DESICCANT BAG INTO DESICCANT CONTAINER AND PLACE IN TOP SUPPORT AS SHOWN. PACK FUSES AS SHOWN IN FIGURE 16. FUSES SHALL BE PACKED IN STANDARD LEAKAGE TEST. THE CONTAINER SHALL BE PACKED IN STANDARD LEAKAGE TEST. THE CONTAINER SHALL BE PACKED IN STANDARD LEAKAGE TEST.

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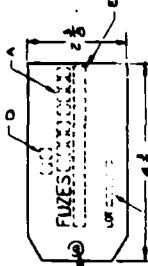
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3. IN	AN	AN	AN
SHEET 2	SHEET 3	SHEET 4	SHEET 5
REVISION	STATUS	STATUS	STATUS



TAG FOR INTERPLANT SHIPMENT

THE TAG SHALL BE ATTACHED SECURELY TO ANY CONVENIENT LOCATION ON OUTSIDE OF BOX. THE TAG SHALL BE ATTACHED SECURELY TO ANY CONVENIENT LOCATION ON OUTSIDE OF BOX. THE TAG SHALL BE ATTACHED SECURELY TO ANY CONVENIENT LOCATION ON OUTSIDE OF BOX.

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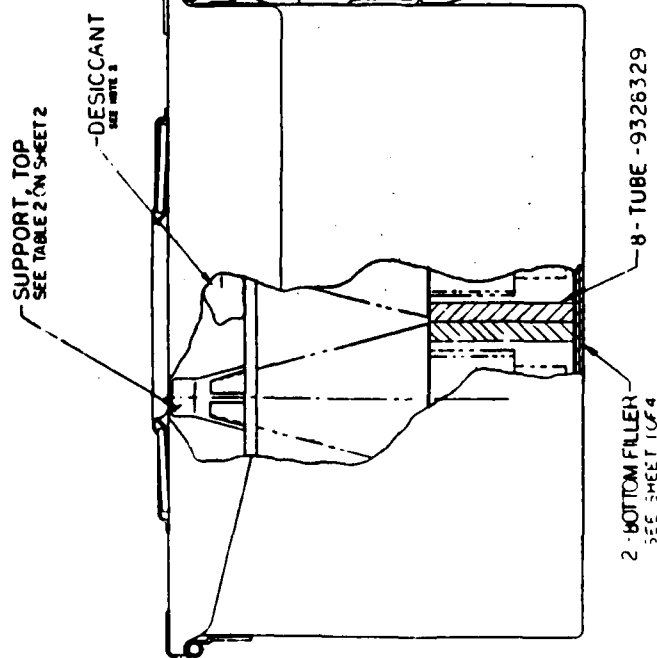
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NON - PROPAGATION PACK ASSY

PACKING INSTRUCTIONS FOR NON-PROPAGATING PACK

P1. ALL MATERIAL SHALL BE THOROUGHLY DRY AT TIME OF PACKING. MOISTURE CONTENT OF PAPER PRODUCTS TO BE 0% MAXIMUM.

P2. ALL AMMUNITION BOXES AND FUZES SHALL BE VISUALLY INSPECTED AT TIME OF PACKING TO ASSURE THAT THERE IS NO CORROSION AND/OR SURFACE CRACKS.

P3. AMMUNITION BOXES SHALL BE PLACED ON TOP OF THE OTHERS. ON EACH BOX, ONE OF THE FOLLOWING SHALL BE PLACED ON THE BOTTOM OF EACH BOX:

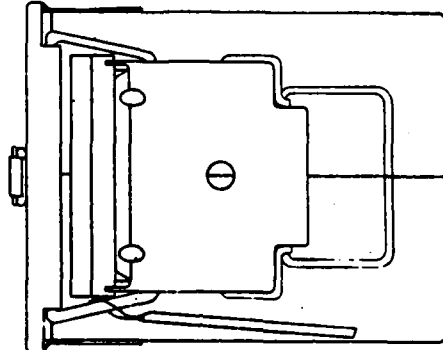
P4. TUBES IN A AND PALLETING, PAGE 4 FUZES IN A BOX DOWNWARD AND WITH BOOSTER INSIDE THE TUBE.

P5. PLACE TOP SUPPORT, 9326329 ON FUZES.

P6. PLACE DESICCANT ON TOP OF CENTER PORTION OF TOP SUPPORT WITH LENGTH OF 646 WITHIN THE SUPPORT (SEE NOTE 3).

P7. IF NECESSARY, IF REQUIRED, SHALL BE ADDED ON BOTTOM OF THE PACKING WITHIN THE TUBE OF 646 WITHIN THE TUBE.

P8. CLOSE AND SEAL CONTAINER. THE CONTAINER SHALL WITHSTAND AN AIR LEAKAGE TEST. SEE SHEET 1 OF 4 OF THIS DRAWING FOR TEST REQUIREMENTS.



PART NO. 9364492

1. AMMUNITION BOX, METAL, FOR ARTILLERY TYPE AND ROCKET FUZES

2. BOX AMMO. METAL, FOR ARTILLERY TYPE AND ROCKET FUZES

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FIGURE 19

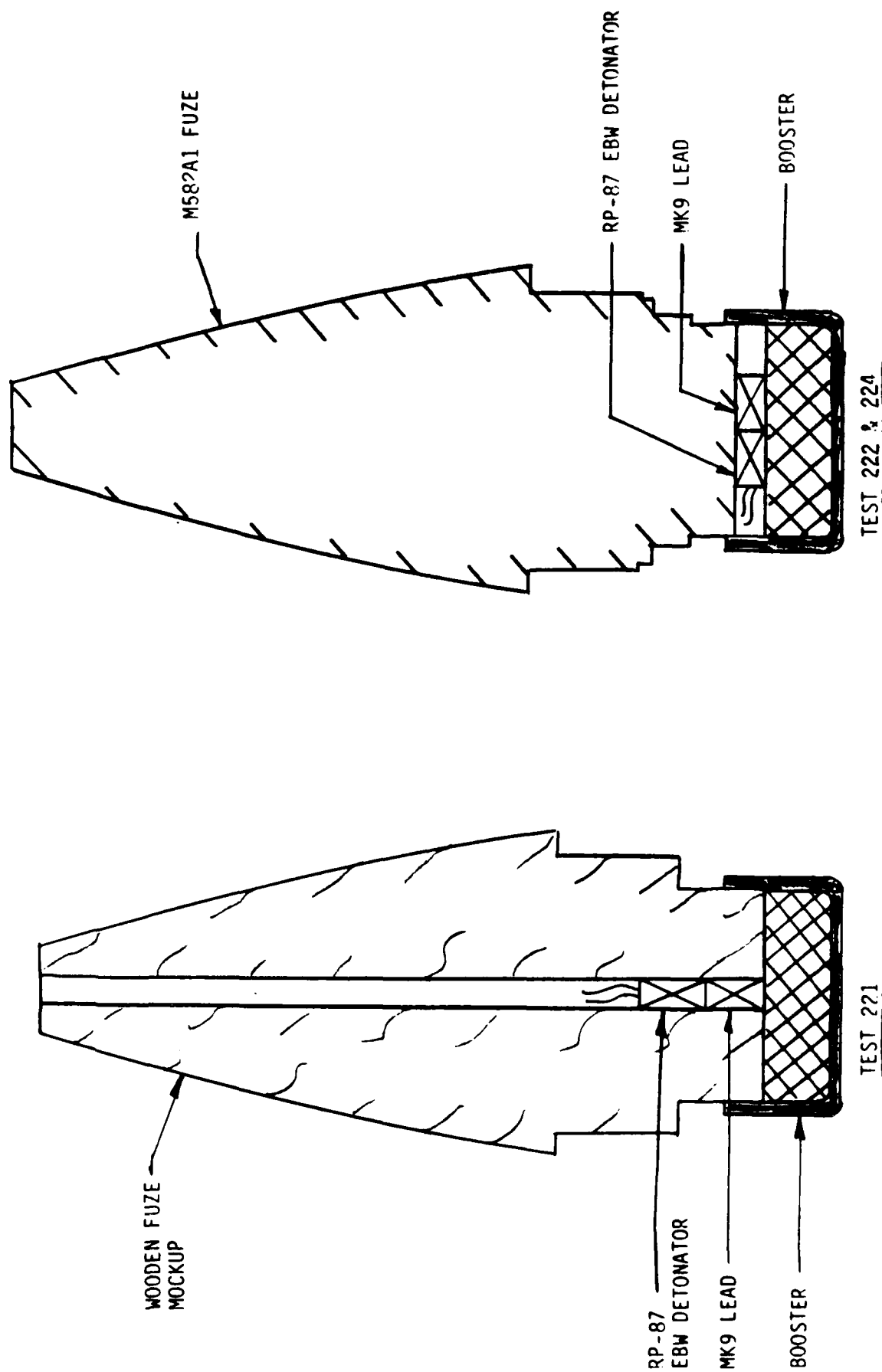


FIGURE 20- INITIATION METHOD SINGLE TACK TESTS

PACKAGED WITH DESICCANT  
DO NOT OPEN  
UNTIL READY FOR USE OR INSPECTION

HAZARD  
CLASSIFICATION  
SINGLE PACK TEST  
221  
OCTOBER 30 1985

FIGURE 21

AMMO CAN WITH DESICCANT PACK AND TEST DATE LABEL



FIGURE 22  
STEEL PLATE AND SAND JACK COLLECTING APPARATUS





HAZARD  
CLASSIFICATION  
SINGLE PACK TEST  
221  
OCTOBER 30 1985

FIGURE 23  
POST TEST RESULTS - TEST 221



FIGURE 24  
CRUSHING OF BOOSTERS - TEST 221



FIGURE 25  
POST TEST RESULTS - TEST 002

PACKAGED WITH DESICCANT  
DO NOT OPEN  
UNTIL READY FOR USE OR INSPECTION

HAZARD  
CLASSIFICATION  
SINGLE PACK TEST  
224  
OCTOBER 31 1985

AVCO

FIGURE 26  
TEST SETUP - TEST 224



FIGURE 27  
POST TEST RESULTS - TEST 224

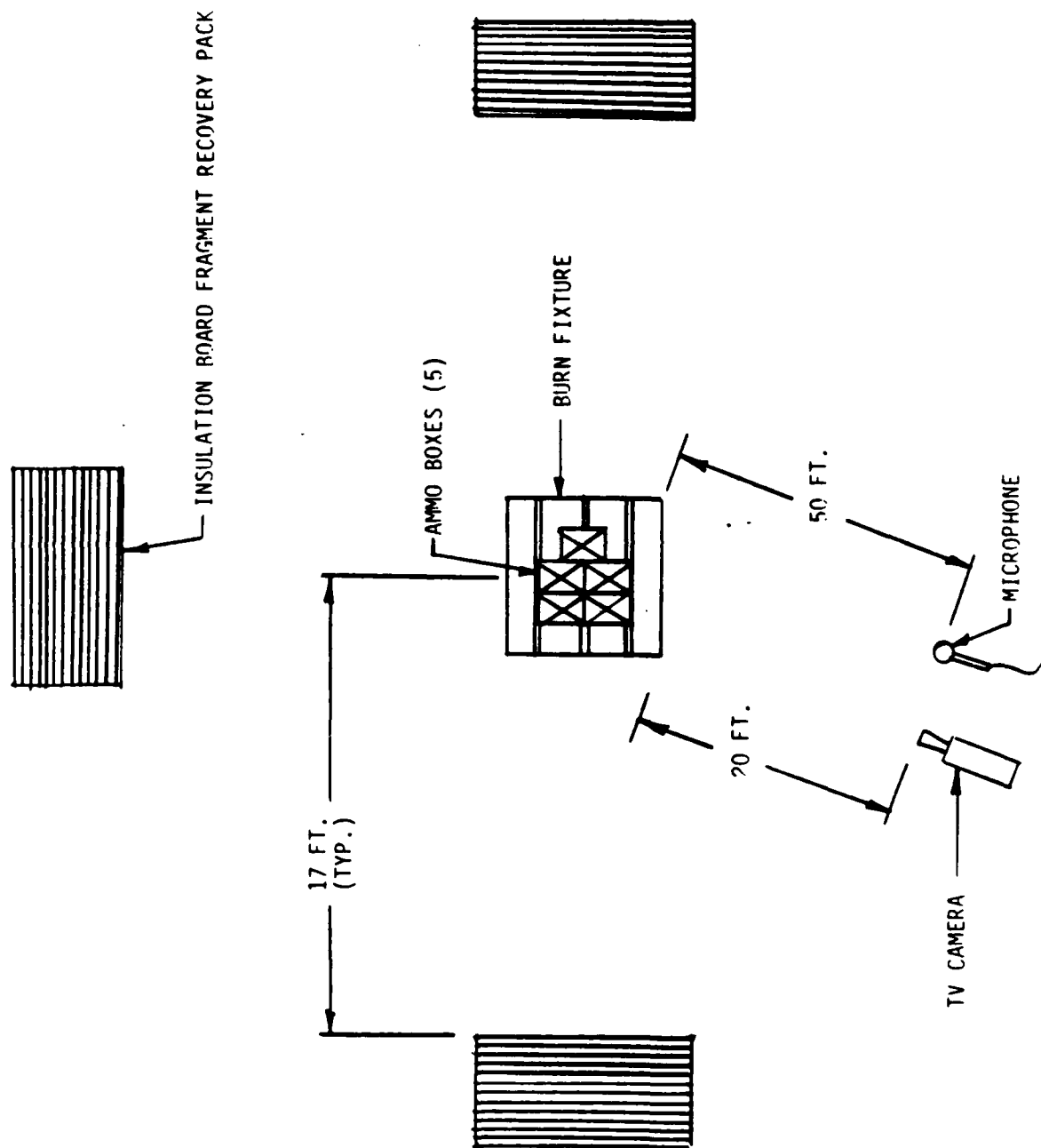


FIGURE 28 - SCHEMATIC OF TEST SETUP, EXTERNAL FIRE STACK TESTS

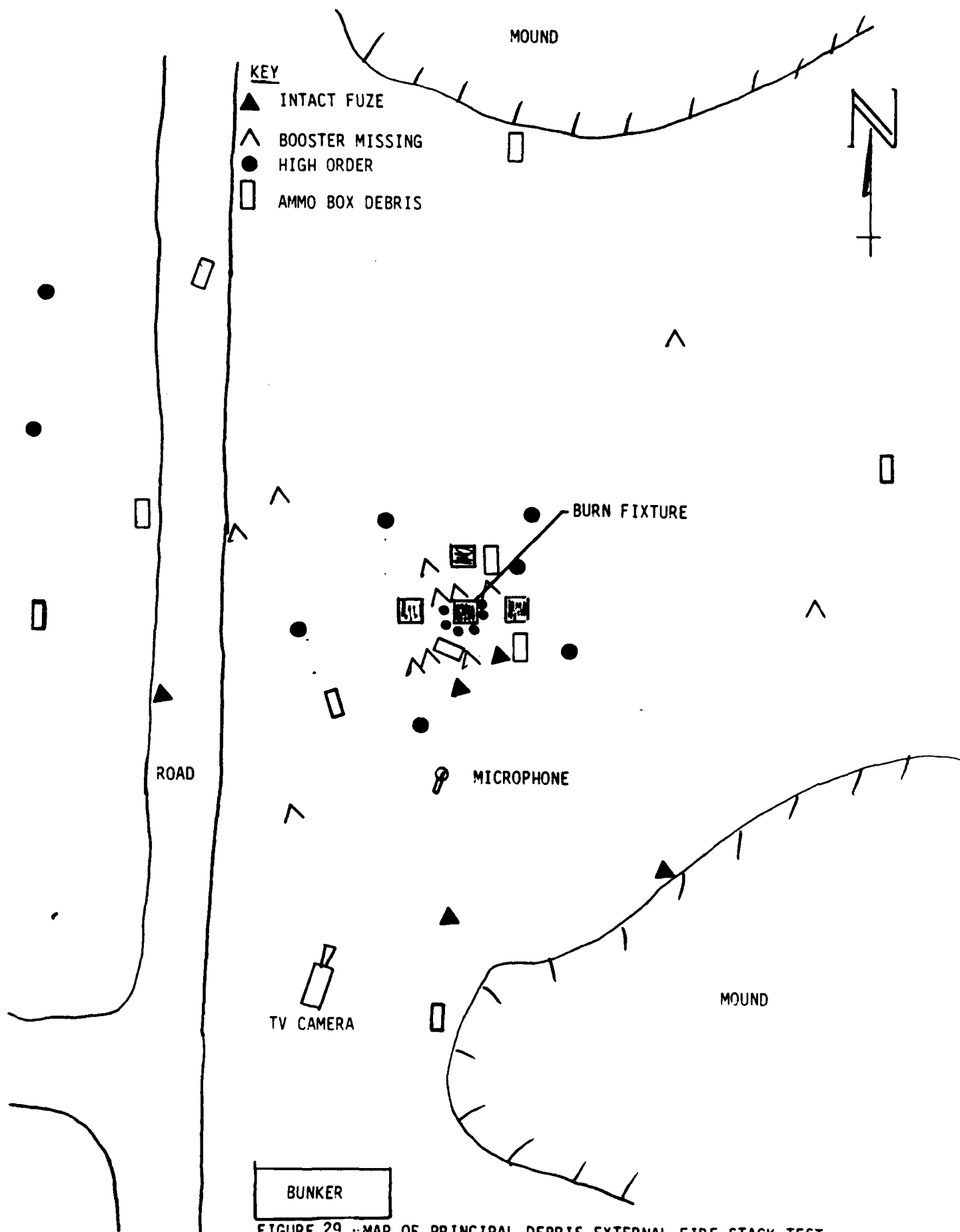


FIGURE 29 --MAP OF PRINCIPAL DEBRIS, EXTERNAL FIRE STACK TEST



FIGURE 30  
WOOD BOXES SET UP ON SIGN FIXTURE





FIGURE 31  
BUPH FIXTURE WITH KINDLING WOOD IN PLACE



FIGURE 32  
BURN FIXTURE AND FRAGMENT RECOVERY PACKS



FIGURE 23

GENERAL VIEW OF TEST AREA FOLLOWING CONDUCT OF PIPE STACK TEST



FIGURE 34

FUZE AND KINPLING DEEPS IN BURN PIT



FIGURE 35  
FUZE AND KIRKLING DEBRIS IN RUIN PIT



FIGURE 3C  
EJECTED FUZE - TEST 223



FIGURE 37

EJECTOR FUZE - TEST 223

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